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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/758,099	01/16/2004	Paul Marcius Butterfield	117435	4975
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EXAMINER				
ZHU, RICHARD Z				
ART UNIT		PAPER NUMBER		
2625				
NOTIFICATION DATE		DELIVERY MODE		
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary

Application No.

10/758,099

Applicant(s)

BUTTERFIELD ET AL.

Examiner

RICHARD Z. ZHU

Art Unit

2625

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 April 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SF/ICE)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Acknowledgement

1. Acknowledgement is made of applicant's amendment made on 4/16/2008. Applicant's submission filed has been entered and made of record.

Response to Applicant's Arguments

2. Previous grounds of rejections are vacated and new grounds of rejections are entered in light of further search and reconsideration.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-9 and 14-20 are rejected under 35 USC 103 (a) as being unpatentable over *Decker et al.* (US 6198549 B1) in view of *Castelli et al.* (US 5748221 A).

Regarding Claim 1, Decker discloses a method for detecting color misregistration in an image forming system (**Abstract**) comprising:

forming a registration pattern with the image forming system (**Fig 2 and see Col 4, Rows 31-34**);

calculating or selecting a combined color value for the registration patch (**Col 4, Rows 30-60, "four pels 206 of black with a color superimposed on top of it"** and see **Col**

8, Rows 20-30, calculating a combined density color value for said pels of black with a color superimposed on top of it);

performing spectrophotometric analysis on the registration patch to detect a detected color value (Co 8, Rows 20-30, using a densitometer to perform spectrophotometric analysis).

determining if color misregistration has occurred (Col 5, Row 62- Col 6, Row 8, Col 7, Rows 5-15, and see Col 8, Rows 20-67, the amount of color misregistration – $C1 * (\text{Density Difference})$) by comparing the detected color value with the combined color value (Col 8, Rows 25-32, the optical density for the second pattern is subtracted from the optical density of the first pattern to derive a density difference, said density difference being used to determine the amount of color misregistration);

obtaining a degree of color misregistration based on known dimensions (Col 6, Rows 15-20, the dimension of the pattern is 8-pel) of the registration patch and an amount of color shift between the detected color value and the combined color value (Figs 2-4, Col 5, Row 62- Col 6, Row 8, Col 7, Rows 5-15, and see Col 8, Rows 20-67, the optical density for the second pattern is subtracted from the optical density of the first pattern to derive a density difference, said density difference being used to determine the amount of color misregistration).

Decker does not disclose forming the registration pattern on a registration patch.

Castelli discloses a method or detecting color misregistration in an image forming system (Col 3, Rows 24-30) comprising forming a registration patch with the image forming system (Col 6, Rows 65-67).

Decker suggested in its background arts that it is well known to form test patterns on patches (Col 1, Rows 14-28). Therefore, it would've been obvious to one of ordinary skill in the art at the time of the invention to form the registration patterns on registration patches so as to correctly measure the optical densities of said registration patterns (*Decker*, Col 1, Rows 14-28).

Regarding Claim 2, *Decker* as modified by *Castelli* discloses the step of forming a registration patch further comprising steps of:

forming the registration patch in a combination of colors having a composite color value equivalent to the calculated or selected value (Col 4, Rows 30-60 and see Col 8, Rows 19-21, colors comprising Cyan, Magenta, Yellow, and Black).

Regarding Claim 3, *Decker* discloses the method for detecting color misregistration further comprising generating an output signal in response to determining if color misregistration has occurred (Col 10, Rows 3-5, the computer informing the user a degree of misregistration by generating an output signal that can be display).

Regarding Claim 4, *Decker* discloses that the output signal indicates whether the image forming system is performing within satisfactory limits (Col 10, Rows 3-5, 2 pel misregistration or a 2.2 pel misregistration).

Regarding Claims 5, *Decker* as modified by *Castelli* discloses the method for detecting color misregistration, performing spectrophotometric analysis and the spectrophotometric analysis further comprising:

scanning the registration patch with a spectrophotometric device (Col 8, Rows 24-25, using a densitometer).

Regarding Claims 6, *Decker* as modified by *Castelli* discloses wherein the forming a registration patch comprises forming a registration patch which has at least two superimposed colors formed in a line perpendicular to a direction of color misregistration (**Fig 2A-B and see Col 4, Rows 52-67**).

Regarding Claim 7, *Decker* discloses the method for detecting color misregistration further comprising performing an adjustment operation if it is determined that an unacceptable level of color misregistration has occurred (**Col 10, Rows 3-20**).

Regarding Claim 8, *Castelli* discloses an image forming system capable of detecting and adjusting for color misregistration comprising:

a plurality of image forming stations, each image forming station forming an image in one color (**Fig 6, Development Stations C and D**);

a charge retentive surface which receives each image from its corresponding image forming station and transfers the combined image to a recording medium (**Fig. 6, belt 10, and see Col 4, Rows 25-30**);

a spectrophotometric device either attached to or integral to the image forming system (**Col 6, Rows 61-64, spectrophotometer connected via neural networks and Col 6, Rows 9-16, the main sensor of the invention is integral to the image forming system**); and

a controller that causes the spectrophotometric device to perform detection of color misregistration on at least one registration patch (**Fig. 7, Controller**).

Castelli does not disclose determining if color misregistration has occurred by comparing a detected color value of the registration patch that is detected by the

spectrophotometric device to a combined value of the registration patch that is calculated or selected.

Decker discloses detection of color misregistration has occurred by comparing a detected color value of the registration patch that is detected by the spectrophotometric device to a combined value of the registration patch that is calculated or selected (**Figs 2-4, Col 5, Row 62- Col 6, Row 8, Col 7, Rows 5-15, and see Col 8, Rows 20-67, the optical density for the second pattern is subtracted from the optical density of the first pattern to derive a density difference, said density difference being used to determine the amount of color misregistration**).

Decker demonstrated that it is a known technique to detect color misregistration by comparing a detected color value of a first pattern on a first patch comprising a single reference color with a combined value of a second pattern on a second patch with a composite density value made of at least two colors. Therefore, it would've been obvious to one of ordinary skill in the art at the time of the invention to modify the known device of *Castelli* with *Decker* in order to detect the amount of color misregistration.

Regarding Claim 9, *Decker* discloses the controller further implements an adjustment to reduce detected misregistration (**Col 10, Rows 3-5**).

Regarding Claim 14, *Castelli* discloses the registration patch is formed in a combination of colors having a composite color value equivalent to the combined color value (**Col 4, Rows 55-58 and see Col 8, Rows 18-32**).

Regarding Claims 15 and 16, *Castelli* discloses the controller further implements an output signal which indicates the results of the detection of the color misregistration (**Col 10,**

Rows 3-5, 2 pel misregistration or a 2.2 pel misregistration) and output signal indicates whether the image forming system is performing within satisfactory limits (**Col 10, Rows 3-18, automatic adjustment until within satisfactory limits**).

Regarding Claim 17, *Decker* discloses the method for detecting color misregistration, performing spectrophotometric analysis and the spectrophotometric analysis further comprising:

scanning the registration patch with a spectrophotometric device (**Col 8, Rows 24-25, using a densitometer**);

and obtaining a degree of color misregistration based on known dimensions of the registration patch (**Col 6, Rows 15-20, the dimension of the pattern is 8-pel because it is the most optimal dimension or best mode**) and an amount of color shift between the color detected by the spectrophotometric device and the calculated or selected color value (**Figs 2-4, Col 5, Row 62- Col 6, Row 8, Col 7, Rows 5-15, and see Col 8, Rows 20-67, the optical density for the second pattern is subtracted from the optical density of the first pattern to derive a density difference, said density difference being used to determine the amount of color misregistration**).

Regarding Claims 18, *Decker* as modified by *Castelli* discloses wherein the forming a registration patch comprises forming a registration patch which has at least two superimposed colors formed in a line perpendicular to a direction of color misregistration (**Fig 2A-B and see Col 4, Rows 52-67**).

Regarding Claim 19, *Decker* as modified by *Castelli* discloses at least one adjustment operation wherein the adjustment operation is able to alter an image forming

process of at least one of the plurality of image forming stations if a spectrophotometric analysis indicates color misregistration has occurred (**Col 10, Rows 3-20, automatic or manual adjustment**).

Regarding Claim 20, *Castelli* discloses an apparatus comprising:

means for forming images (Col 4, Rows 5-7, an imaging system);

means for creating at least one registration patch (Col 6, Rows 65-67, a number of patches) having a combined color value (Col 6, Row 67 – Col 7, Row 2, colors are selected to adequately represent the printer's collection of colors, a combination of RGB or CMYK);

means for performing spectrophotometric analysis on the at least one registration patch to detect a detected color value (Col 3, Rows 34-40 and Col 6, Rows 61-63);

means for determining if color misregistration has occurred based on the spectrophotometric analysis of the registration patch (Col 6, Rows 10-30);

means for adjusting the image forming process to adjust for the color misregistration (Col 6, Rows 22-27).

Castelli does not disclose means for determining if color misregistration has occurred on images formed by the means for forming images by comparing the detected color value to the combined color value.

Decker discloses means (**Col 9, Rows 1-10, a computer program and see Fig 8, Internal Densitometer 18**) for determining if color misregistration has occurred (**Col 5, Row 62- Col 6, Row 8, Col 7, Rows 5-15, and see Col 8, Rows 20-67, the amount of color**

misregistration – $C1 * (\text{Density Difference})$) by comparing the detected color value with the combined color value (Col 8, Rows 25-32, the optical density for the second pattern is subtracted from the optical density of the first pattern to derive a density difference, said density difference being used to determine the amount of color misregistration);

obtaining a degree of color misregistration based on known dimensions (Col 6, Rows 15-20, the dimension of the pattern is 8-pel) of the registration patch and an amount of color shift between the detected color value and the combined color value (Figs 2-4, Col 5, Row 62- Col 6, Row 8, Col 7, Rows 5-15, and see Col 8, Rows 20-67, the optical density for the second pattern is subtracted from the optical density of the first pattern to derive a density difference, said density difference being used to determine the amount of color misregistration).

Decker demonstrated that it is a known technique to detect color misregistration by comparing a detected color value of a first pattern on a first patch comprising a single reference color with a combined value of a second pattern on a second patch with a composite density value made of at least two colors. Therefore, it would've been obvious to one of ordinary skill in the art at the time of the invention to modify the known device of *Castelli* with *Decker* in order to detect the amount of color misregistration.

5. Claims 10-13 are rejected under 35 USC 103 (a) as being unpatentable over the combined teachings of *Decker et al. (US 6198549 B1)* and *Castelli et al. (US 5748221 A)* in view of what is well known.

Regarding Claims 10-13, *Castelli* discloses each elements of Claim 9 from which Claims 10-13 are dependent upon.

Furthermore, *Castelli* discloses that the image forming system is an imaging system that is used to produce color outputs (**Fig. 6, printing machine and Col 4, Rows 5-10**).

However, *Castelli* does not explicitly disclose that the printing machine is a digital photocopier, an ink jet printer, or a laser printer.

Nonetheless, the cited printing machines are well known species of genus printing machines and it is well within the knowledge of one ordinarily skilled in the art to use the above-mentioned copiers and printers as the image forming system because each of said copiers and printers are qualified to perform superbly in the endeavor of color printing and they are all very well known under the sun (**Official Notice**).

It would've been obvious to one ordinarily skilled in the art at the time of invention to use either a digital photocopier, an ink jet printer, a laser printer, a facsimile machine, or a combination facsimile machine and printer machine as the printing machine of the combined teachings in order to enable the printing of multi-color images from which spectrophotometric analysis can be performed.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: US 6295374 B1, US 6529616 B1, and US 6654145 B1 discloses method and apparatus for color misregistration detection and correction.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to examiner Richard Z. Zhu whose telephone number is 571-270-1587 or examiner's supervisor King Y. Poon whose telephone number is 571-272-7440. Examiner Richard Zhu can normally be reached on Monday through Thursday, 6:30 - 5:00.

Art Unit: 2625

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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05/19/2008

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